

CLAIMS

What is claimed is:

1. A non-aqueous electrolyte secondary battery comprising:
 - 5 a negative electrode with a composite layer containing a negative active material;
 - a positive electrode; and
 - a non-aqueous electrolyte;

characterized in that

10 said negative active material is an alloy containing 5 to 25 mass% of nickel and 75 to 95 mass% of tin, and
said alloy contains Sn_4Ni_3 phase and Sn phase.

2. The non-aqueous electrolyte secondary battery according to claim 1, characterized in that the content ratio of Sn_4Ni_3 phase and Sn phase in said alloy is $0.2 \leq Z \leq 3$ when m_1 is the mass of Sn_4Ni_3 phase, m_2 is the mass of said Sn phase, and $Z = m_1 / m_2$.

15 3. The non-aqueous electrolyte secondary battery according to claim 1 or claim 2, characterized in that said composite layer contains carbon material.

20 4. The non-aqueous electrolyte secondary battery according to claim 1 or claim 2, characterized in that
said composite layer contains carbon material, and
when n_1 is the mass of said alloy, n_2 is the mass of said carbon material, and $S = n_1 / n_2$, S falls within the range of $0.05 \leq S \leq 3.5$.

25 5. The non-aqueous electrolyte secondary battery according to claim 1 or claim 2, characterized in that
in said composite layer, powdered negative active material is used, and
the porosity of said composite layer is 30 to 75 %.

30 6. The non-aqueous electrolyte secondary battery according to claim 3, characterized in that
in said composite layer, powdered negative active material is used, and
the porosity of said composite layer is 30 to 75 %.

35 7. The non-aqueous electrolyte secondary battery according to claim 4, characterized in that

in said composite layer, powdered negative active material is used, and

the porosity of said composite layer is 30 to 75 %.

8. The non-aqueous electrolyte secondary battery according to claim 1 or claim 2, characterized in that

the apparent density of said negative electrode is 2.5 to 8.3 g/cm³.

9. The non-aqueous electrolyte secondary battery according to claim 3, characterized in that

10 the apparent density of said negative electrode is 2.5 to 8.3 g/cm³.

10. The non-aqueous electrolyte secondary battery according to claim 4, characterized in that

the apparent density of said negative electrode is 2.5 to 8.3
15 g/cm³.